CLAIMS

We claim:

1. A waveguide array for transmitting electromagnetic energy comprising:

a plurality of substrate rows; and

at least one waveguide in each of said plurality of substrate rows, each of said waveguides having a central axis and a waveguide face for transmitting said electromagnetic energy, said waveguide face being angled to said waveguide central axis;

wherein each of said waveguides are aligned substantially parallel to each other in said substrate rows and at an offset angle to said waveguide array; and

wherein said offset angle and said angle of said waveguide face are such that said electromagnetic energy transmitted from each of said waveguide faces is substantially parallel to each other and substantially normal to said waveguide array.

2. The waveguide array of Claim 1, wherein said waveguide comprises an optical fiber.

3. The waveguide array of Claim 2, wherein said optical fiber comprises of one or more selected from the group consisting of glass and polymers.

4. The waveguide array of Claim 1, wherein said substrate rows comprise one or more selected from the group consisting of silicon, ceramics, and metal oxides.

5. The waveguide array of Claim 1, wherein said electromagnetic energy comprises one or more selected from the group consisting of microwaves, visible light, and infrared radiation.

6. A fiber optic array comprising:

a plurality of substrate rows; and

at least one optical fiber in each of said plurality of substrate rows for transmitting light, each of said optical fibers having a central axis and a face for transmitting said light, said optical fiber face being angled to said optical fiber central axis;

wherein each of said optical fibers are aligned substantially parallel to each other in said substrate rows and at an offset angle; and

wherein said offset angle and said angle of said fiber face are such that said light transmitted from each of said optical fiber faces is substantially parallel to each other and substantially normal to said fiber array.

7. The fiber array of Claim 6, wherein said optical fiber comprises one or more selected from the group consisting of glass and polymers.

8. The fiber array of Claim 5, wherein said optical fiber is one or more selected from the group consisting of single mode fibers, multi-mode fibers, and grated

index fibers.

9. The fiber array of Claim 5, wherein said substrate layers comprise one or more selected from the group consisting of silicon, ceramics, and metal oxides.

10. A method for transmitting electromagnetic energy in a waveguide array comprising the steps of:

creating a plurality of substrate rows;

embedding at least one waveguide in each of said plurality of substrate rows, wherein each of said waveguide has a central axis and a waveguide face for transmitting said electromagnetic energy;

forming and said waveguide face at an angle to said waveguide central axis; and

aligning each of said waveguides in each of said plurality of substrate rows substantially parallel to each other and at an angle offset to said waveguide array, such that said electromagnetic energy transmitted from each of said waveguide faces is substantially parallel to each other and substantially normal to said waveguide array.

11. The method of Claim 10, wherein said waveguide comprises an optical fiber.

12. The method of Claim 11, wherein said optical fiber comprises one or more selected from the group consisting of glass and polymers.

13. The method of Claim 10, wherein said substrate rows comprise one or more selected from the group consisting of silicon, ceramics, and metal oxides.

14. A method for transmitting electromagnetic energy in a fiber optic array comprising the steps of:

creating a plurality of substrate rows;

embedding at least one optical fiber in each of said plurality of substrate rows, each of said optical fibers having a central axis and a fiber face for transmitting said light;

forming said fiber face at an angle to said central axis; and

aligning each of said optical fibers in said substrate rows substantially parallel to each other and at an offset angle to said fiber array such that light transmitted from each of said fiber faces is substantially parallel to each other and substantially normal to said fiber array.

15. The method of Claim 14, wherein said optical fiber comprises one or more selected from the group consisting of glass and polymers.

16. The method of Claim 14, wherein said optical fibers are one or more selected from the group consisting of single mode fibers, multi-mode fibers, and grated index fibers.

17. The method of Claim 14, wherein said substrate rows comprise one or more selected from the group consisting of silicon, ceramics, and metal oxides.